



PATENTS
101117-0081

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:)
Mack J. Schermer)
Serial No.: 09/354,500) Examiner: Allen, M.
Filed: July 16, 1999)
For: METHOD AND SYSTEM FOR) Art Unit: 1631
AUTOMATICALLY)
CREATING CROSSTALK-)
CORRECTED DATA OF A)
MICROARRAY)

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November 17, 2006

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Commissioner for Patents
P.O. Box 1450
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Sir:

RESPONSE

We have carefully considered the Office Action dated July 17, 2006, in which claims 1-18 are rejected under section 112. All rejections based on cited prior art have been overcome.

The Examiner states “Claims 1 and 10 have been amended to recite “computing a set of correction factors based on ratios.” We point out that the independent claims state, respectively, that the correction factors are based specifically on ratios of **the output measurements**. As further set forth in the claims, the output measurements are obtained by **measuring an output of each of the output channels for each of the calibration dye spots**. Thus, the ratios are not “all ratios of output.” The ratios for a two channel

system are specifically shown on page 7 of the application, and expansion to three or more channels is discussed on pages 8-10.

Thus, the ratios of claims 1 and 10 that are calculated for a given channel are the ratios of the output measurements obtained for respective calibration dye spots over that channel. For example, in a three channel system in which channel 1 is optimized for dye 1, crosstalk results when emissions from dyes 2 and 3 are included in measurements obtained from channel 1. The emissions from dye 1 in channel 1 are not crosstalk, by definition. Accordingly, the crosstalk correction factors are based on respective crosstalk ratios α_{12} and α_{13} , which are ratios of the respective output measurements for calibration dye spots 2 and 3 obtained from channel 1 (crosstalk emissions) and the output measurements for the calibration dye spot 1 from channel 1. Similarly, for channel 2 that is optimized for dye 2, for example, the crosstalk ratios α_{21} and α_{23} are ratios of the respective output measurements for calibration dye spots 1 and 3 obtained over channel 2 (crosstalk emissions) and the output measurements for the calibration dye spot 2 obtained over channel 2, and so forth for additional channels and/or calibration spots.

Claim 7, which depends from claim 1, explicitly states that the step of computing includes the step of computing crosstalk ratios based on spot brightness values for each of the calibration dye spots on each of the output channels. See, application page 7. Claim 16, which depends from claim 10, adds the same limitation to claim 10.

We remain confused by the section 112 enablement rejections. Certainly, microarray scanners are well known in the art, as are computers for processing output measurement or brightness value signals produced by the scanners. Figures 7 and 8 show the computers and system of a microarray scanner and computers that may be used to perform, for example, the steps of method claim 10. The microarray scanner and associated computers, which are well known to one skilled in the art, perform the functions of scanning microarrays, analyzing the scan data and producing corresponding output measurements, or brightness values. This is specifically set forth also on page 6, lines 16-19 and page 7, lines 1-6. Further, as discussed on page 2, lines 13 et seq., microarray scanners or readers quantitate the brightness of each microarray spot. Using

the same techniques, the microarray scanner or reader operating in accordance with the invention performs the same functions for the calibration dye spots.

The inventive system and method next **computes** a set of correction factors. See, e.g., page 3, lines 23 et seq. As set forth on page 5, lines 22 et seq. and Figures 7 and 8, the computational portion of the method of the present invention is preferably performed using a computer. In deed, on page 6, lines 4-6, the application states that the computational portions of the method are performed on a workstation, that is, by computer.

A quick internet search for microarray scanners provides links to many websites that describe such scanners. The computers, properly programmed, perform the calculation steps involved in processing the scan data. One skilled in the art would readily understand how to operate the microarray scanner to scan the calibration dye spots and how to program a computer to perform the computation steps of the current invention, all in accordance with claim 10.

Accordingly, one skilled in the art understands that to perform the computational steps of the invention, a computer is programmed to perform the steps of computing a set of correlation factors in accordance with the discussion on pages 7-10 of the application and applying the set of factors to the quantitation data, that is, to data that are produced by conventionally processing the scan data associated with the remaining microarray spots, i.e., the spots that are not calibration dye spots. The computation steps of applying the correction factors are set forth on page 10, lines 5 et seq.

Accordingly, in the inventive system, a microarray scanner or reader scans the calibration dye spots over the respective channels and produces corresponding output measurements, as set forth in claim 10 and on page 7, lines 1-6. The computer that performs the computation steps involved in processing the output measurements, or signal values, to produce crosstalk correction factors that are based on ratios of the output measurements and apply the correction factors to the quantitation data, that is, the computer that is part of the system of Figure 8, is readily programmed to perform the computational portion of the method of claim 10 in accordance with the discussion set

forth on pages 7-10. Thus, the microarray scanner and associated computers are linked in the application to the scanning and computational steps of claim 10.

In light of the above, we request that the Examiner reconsider her rejections of claims 1-18 based on section 112, and issue a Notice of Allowance for all pending claims.

Please charge any fee occasioned by this paper to our Deposit Account
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Respectfully submitted,

A handwritten signature in cursive script, reading "Patricia A. Sheehan". The signature is written in dark ink and is positioned above a horizontal line.

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